

3. The method of claim 1 wherein the thermally-treated phosphorus-sulfur compound is prepared by heating a phosphorus-sulfur compound at a temperature of from about 160° to about 500°C.

4. The method of claim 3 wherein the phosphorus-sulfur compound is selected from mono- or di-substituted thiophosphonates esters, phosphorothioites, phosphorothioates and thiophosphonates.

5. The method of claim 4 wherein the phosphorus-sulfur compound is a trisubstituted phosphorothioate.

6. The method of claim 5 wherein the trisubstituted phosphorothioate is a s,s,s-trialkyl phosphorothioate.

7. The method of claim 6 wherein the s,s,s-trialkyl phosphorothioate is s,s,s-tibutyl phosphorothioate.

8. The method of claim 4 wherein the phosphorus-sulfur compound is a mono- or di-substituted thiophosphate ester.

9. The method of claim 8 wherein the mono- or di-substituted thiophosphate ester is a mono- or di-alkyl thiophosphate ester.

10. The method of claim 9 wherein the mono- or di-alkyl thiophosphate ester is mono- or dioctyl thiophosphate ester or mono- or di(ethyl)hexyl thiophosphate ester.

11. The method of claim 3 wherein the thermally-treated phosphorous-sulfur compound is prepared by heating a phosphorus-sulfur compound at a temperature of from about 180° to about 280°C.

12. The method of claim 3 wherein the thermally-treated phosphorous-sulfur compound is prepared by heating a phosphorus-sulfur compound at a temperature of from about 200° to about 260°C.

13. The method of claim 3 wherein the phosphorus-sulfur compound is heated in an oxygen and water-free atmosphere.

14. The method of claim 2 comprising injecting the thermally-treated phosphorus-sulfur compound into the pyrolysis furnace prior to processing the hydrocarbon feedstock.

15. The method of claim 14 wherein the thermally-treated phosphorus-sulfur compound is injected into the pyrolysis furnace from about 30 minutes to about 24 hours prior to processing the hydrocarbon feedstock.

16. The method of claim 2 comprising injecting the thermally-treated phosphorus-sulfur compound into the pyrolysis furnace simultaneously with hydrocarbon feedstock.

17. The method of claim 2 comprising injecting from about 1 to about 1000 ppm of the thermally-treated phosphorus-sulfur compound into the pyrolysis furnace.

18. The method of claim 2 comprising injecting from about 10 to about 100 ppm of the thermally-treated phosphorus-sulfur compound into the pyrolysis furnace.

19. A method of injecting a thermally treated phosphorus-sulfur compound into a pyrolysis furnace coil comprising pumping a phosphorus-sulfur compound through a microthermal reactor, wherein the microthermal reactor is heated such that the effluent from the microthermal reactor comprises thermally-treated phosphorus-sulfur compound, and injecting the thermally-treated phosphorous-sulfur compound into the pyrolysis furnace coil.

20. The method of claim 19 wherein the effluent from microthermal reactor has a temperature of from about 200°C. to about 500°C.

21. The method of claim 19 further comprising mixing the phosphorous-sulfur compound or the thermally-treated phosphorous sulfur with a carrier.

22. The method of claim 21 wherein the carrier is a gas or a liquid.

23. The method of claim 21 wherein the carrier is steam.

24. The method of claim 21 wherein the carrier is an inert gas.

25. The method of claim 24 wherein the carrier is nitrogen.

26. The method of claim 21 wherein the carrier is natural gas.